Journal of Academic Ethics (2026) 24:56
https://doi.org/10.1007/s10805-026-09732-5

# Public Trust in Science: A Systematic Literature Review

**Kalypso Iordanou**[1] · **Antonis Antoniou**[1] · **Maura De Vos**[1]

Received: 19 September 2025 / Accepted: 23 February 2026


**Abstract**

This systematic literature review of factors influencing public trust in science provides insights for strengthening science-society relationships and informing responsible research practices. Our analysis of 124 empirical studies reveals multiple factors that are linked to trust in science, which we organize into three key categories: (a) Receiver—individual characteristics of the public, (b) Message—scientific information and its delivery, and (c) Source—scientists and the scientific method. Our synthesis demonstrates that trust in science is related to multiple factors, from individual factors (prior beliefs, attitudes, values, epistemic beliefs) to communication (such as channel credibility, ethics communication) and scientific practices (open science, replicability). Our findings have several important implications for research practice, science communication and education. Most notably, the findings highlight the pivotal role of research integrity in fostering and maintaining public trust in science, with scientists' perceived integrity, epistemic practices that support transparency, and epistemic inclusion all being fundamentally interconnected in shaping public trust.

**Keywords** Public trust in science · Systematic literature review · Science communication · Research integrity · Epistemic beliefs · Epistemic trust · Science and society

## Introduction

In the contemporary sociopolitical landscape where science faces challenges through political weaponization and undervaluation by government officials (Korte, 2025; APA, 2025), identifying determinants of public trust in science is of paramount importance for providing crucial insights for safeguarding the scientific enterprise against external pressures that threaten to compromise its integrity and societal impact. In the face of the threat that recent instances of research suppression pose to public trust in science, the scientific community's voices have emerged in a call to stand for science (Korte, 2025; APA, 2025). The current work examining the factors that are associated with public trust in science through a sys-

✉ Kalypso Iordanou
KIordanou@ulcan.ac.uk

[1] UCLan Cyprus, 12 – 14 University Avenue Pyla, Larnaka 7080, Cyprus

Published online: 11 March 2026

tematic literature review provides crucial insights into the tools to be used in response to the scientific community's call to 'stand for science'.

Close collaboration between science and society is fundamental for society's ability to respond effectively to global challenges, as was evident during the unprecedented COVID-19 pandemic (Barattucci et al., 2022). Similarly, in addressing the climate change challenge, public trust in science is important, in light of the evidence that public trust in climate science correlates with support for climate change mitigation policies and individual pro-environmental behaviors (Cologna & Siegrist, 2020).

The issue of trust in science has received significant and growing multidisciplinary interest (Iordanou et al., in press; Zeybek Kabakci et al., 2025). Recent work has begun to bridge disciplinary boundaries to understand more holistically what shapes, and undermines, public trust in science. Goldenberg (2023) conceptualizes public trust in science as a two-way relationship, arguing that mistrust often reflects structural injustices, institutional failures, and politicization rather than mere ignorance. Concurrently, Zeybek Kabakci et al. (2025) provide an interdisciplinary overview of trust in science, mapping dominant themes in the literature related to science communication, public engagement, and compliance with scientific advice, and highlighting the roles of sociocultural context, political ideology, perceived competence and integrity of scientists, misinformation, and institutional credibility. Despite these important contributions and the growing attention to the issue, research remains fragmented across domains and disciplines.

The present work adopts an interdisciplinary perspective and argues that (dis)trust in science should be examined in the context of an ecosystem of trust (Gurzawska et al., in press), rather than only as a communication issue. For example, the rise of science-related populism (Cologna et al., 2025), characterized by a perceived antagonism between ordinary people and academic elites, challenges scientists' decision-making authority and suggests that their epistemic claims are inferior to common sense, often without engaging with the substance of scientific evidence (Mede & Schäfer, 2020). Our approach aims to capture the complexity of trust in science by identifying factors at different levels (i.e., individual and societal) that are associated with trust in science in order to bring science and society closer to each other.

This complexity necessitates moving beyond simplistic, single-factor explanations of public trust. Although research reveals a relationship between domain-specific knowledge and attitudes toward science, this relationship is generally weak and varies significantly across different scientific domains (Allum et al., 2008). Given that the knowledge deficit model of science communication—which attributes public distrust to insufficient knowledge—cannot fully explain public trust in science (Grant, 2023; Scheufele, 2022), there is a clear need to better understand the diverse factors that influence trustworthiness judgments of science. Understanding the dynamics associated with trust in science at different levels—such as social, political, and institutional (Gundersen & Holst, 2022)—and the particular characteristics of trustworthiness—such as a source's expertise, integrity, and benevolence (Hendriks et al., 2016)—will provide insights on how to bring science closer to society and enhance trustful relations between the two.

## Conceptualizing Trust in Science

Before examining the empirical evidence on factors influencing trust, we must first establish what "trust in science" entails. We view public trust in science as having a complex, multifaceted, multi-actor, and context-dependent nature (Iordanou et al., in press). Trust is generally defined in the relevant literature as a three-place relationship between the truster, the trustee, and the object of trust: A person (the truster) trusts another person (the trustee) with something (the object of trust), which can be an action, a state of affairs, or a proposition (cf. Hardin, 2002). Baier (1986) describes trust as a special kind of reliance on the trustee's good will that also involves a form of risk-taking and thus makes the truster vulnerable. People therefore rely on multiple cues to decide whether a trustee is trustworthy. In the context of the public trust in science, the truster embodies members of the public that are laypeople and therefore, do not have direct access to scientific results and the methods that produce them, whereas the trustee embodies science as an enterprise for the acquisition of knowledge. To trust science, exhibiting what is called epistemic trust (Bromme & Hendriks, 2024), is to accept that scientific knowledge is very likely to be true and rely on science regarding the validity of knowledge, despite the fact that there is no first-hand access to the methods producing this knowledge, which further implies a degree of vulnerability and a form of risk-taking. However, epistemic trust involves not only believing others uncritically but also being vigilant of the possibility of misinformation and disinformation (Hendriks et al., 2015). By examining public trust in science, we do not claim that the public should uncritically trust science at all times. Warranted skepticism, grounded in evidence, is inherent to scientific functioning and essential for scientific progress (Hendriks et al., 2016). Science's historical relationship with and abuses of marginalized communities provides justified grounds for caution, as past ethical violations against these groups have created legitimate mistrust in these populations (Scharff et al., 2010). Similarly, the reproducibility crisis raised doubts about the reliability of scientific methods and findings (Hendriks et al. 2020b). Society's skepticism of science could offer a valuable opportunity for science to reflect on its mechanisms and consider how to make them stronger and more reliable. Our aim in the present work is not to suppress epistemic vigilance, but rather to distinguish between evidence-based skepticism and uncritical denial of science, ultimately promoting *informed* trust in scientific institutions and findings (Kienhues et al., 2020).

Despite this conceptual foundation, trust in science lacks a single broadly acceptable definition or even consistent terminology. While some scholars focus on *epistemic trust* (Bromme & Hendriks, 2024), others use the term *credibility* to describe judgments on whether one can rely on scientific claims (König & Jucks, 2019), or *source credibility* to describe positive characteristics that will lead to acceptance of a message (Ohanian, 1990). Others employ the term *trustworthiness* to refer to the underlying characteristics that make scientific sources worthy of trust, or *epistemic trustworthiness*, which describes the features of the trustee that decide whether individuals will depend on and defer to them due to their own limited resources (Landrum et al., 2015). Mayer et al. (1995) identified that the crucial factors of trustworthiness are: expertise (the perception of necessary skills and expertise in the relevant domain), benevolence (the belief that the trustee is oriented toward doing good for the trustor), and integrity. Integrity specifically focuses on perceptions about a trustee's sense of morality and justice (Hautea et al., 2024), encompassing perceptions of scientists' honesty, consistency, and adherence to ethical standards. Measuring trust is also challenging. Besley and Tiffany (2023) noted that direct measures of trust capture only some aspects of trustworthiness, and that "behavioral trust"—which involves the willingness to make oneself vulnerable—is particularly difficult to assess. Behm-Bahtat et al. (in press), in reviewing trust measures and identifying this issue, claimed that trust research suffers from what Peters and Crutzen (2024) call the "jingle-jangle jungle" problem, referring to the jingle fallacy—"the erroneous assumption that two measures that are called by the same name measure the same construct"—and the jangle fallacy—"the erroneous assumption that two measures with different names measure different constructs, whereas in reality they measure the same thing" (Peters & Crutzen, 2024).

Given this conceptual heterogeneity in how trust is defined, measured, and studied, our review adopts an inclusive approach that encompasses studies using various terminologies (trust, credibility, trustworthiness) and examining different dimensions (trust in science broadly, in scientists, in scientific institutions, in specific disciplines). This inclusive strategy, detailed in our Methods section, allows us to synthesize the current state of knowledge across different fields, despite this conceptual diversity. We now turn to describing how we systematically identified and analyzed this fragmented literature to provide an integrative synthesis.

### The Present Study

Given this multidimensional and context-dependent nature of trust in science, there is a need for a systematic synthesis of the empirical evidence on factors that shape public trust across different domains and populations. This systematic literature review addresses this gap by synthesizing findings from 124 empirical papers spanning social and educational psychology, medicine, science education, and science communication to provide a comprehensive, evidence-informed understanding of factors associated with public trust in science.

This comprehensive approach is warranted for several reasons. Although scientists and scientific methods enjoy trust in most countries (Cologna et al., 2025), even small distrusting minorities warrant serious attention, as they can disproportionately influence both policy considerations of scientific evidence and individual decision-making, particularly when they receive extensive media coverage or include individuals in positions of power (Lewandowsky et al., 2019; Centola et al., 2018). While previous empirical research has identified several factors associated with lower trust in science—including being male, holding conservative political beliefs, having high social dominance orientation (SDO), and endorsing science-populist attitudes (Cologna et al., 2025)—a systematic integration of the broader evidence base across disciplines has been lacking. Our review fills this gap by comprehensively mapping the full range of factors associated with trust in science identified across diverse research disciplines.

We organize our findings using a sender-scientific information-receiver framework (Lasswell, 1948), categorizing factors based on their association with the producer of the scientific information (Source), the scientific information and its transmission (Message), or the receiver of the scientific information (Receiver).

## Method

The methodology for the completion of the present Systematic Literature Review was based on the PRISMA protocol (Page et al., 2021). PRISMA is widely used as a basis for reporting systematic reviews and it has been selected due to the high-levels of rigorousness it provides, and its wide recognition as one of the best protocols for standardizing literature review processes. The inclusion criteria of literature were: (1) studies directly examining the correlation and causal relationship of various factors to the levels of public trust in science; (2) the factors correlated and affecting the public trust in science had to be investigated empirically, without any restrictions in the methodology; (3) published in English in peer-reviewed journals; and (4) participants were adults. We adopted a comprehensive approach to trust in our review, encompassing multiple dimensions: trust in science as an enterprise, in individual scientists, in scientific institutions, in scientific claims and findings, in specific disciplines, and in scientific evidence about particular issues (such as climate change or COVID-19). This comprehensive approach to trust in science enabled us to synthesize current knowledge, identify gaps in existing literature, and offer practical implications for future research.

The systematic literature review comprised a comprehensive search of articles in three electronic databases: Scopus, Web of Science and PsycInfo. The selected search strategy was based on the two core concepts of our main research question, namely, 'trust' and 'science'. The search items were (trust* OR distrust* OR mistrust*) AND (scien*) in TITLE for the first search and (trust* OR distrust* OR mistrust* OR credib*) AND (scien* OR research*) in TITLE, for the second and third searches. The review focused on keyword search in titles only (rather than in abstracts and keywords as well), following precedents of similar reviews (e.g., Lazić & Žeželj, 2021) and to manage the extensive number of papers that the search keywords revealed. To examine our research question: What factors are associated with public trust in science?, we tried to be inclusive encompassing all studies claiming to examine public trust in science that satisfied our inclusion criteria. Yet, this was a challenging task that involved synthesizing findings from very diverse studies, particularly given the acknowledged lack of clear and consistent conceptualization and operationalization of the term "trust in science" (as discussed in the Conceptualization section above).

The search was performed in all three databases on 1st October 2024, with interim searches conducted throughout the review process to ensure comprehensiveness. No time constraints were imposed on the search queries, allowing for the inclusion of all relevant literature regardless of publication date. The combined search in the three databases resulted in an initial list of 10,170 articles. Because Scopus, Web of Science, and PsycInfo have substantial overlap in journal coverage, many articles were retrieved more than once across the databases. After the removal of duplicates, 2418 articles remained. In the first screening stage, titles and abstracts were assessed based on the eligibility criteria. The full set of articles was evenly distributed among a team of trained coders, ensuring that each article was independently screened by two researchers. Coders marked each article as 'eligible', 'ineligible', or 'maybe eligible'. If the abstract lacked sufficient details, the full text was consulted during the second phase. Otherwise articles were retained for full-text screening if both coders marked them as eligible, or if there was partial agreement (e.g., one marked 'eligible' and the other 'maybe eligible'). To assess the consistency of this process, inter-rater reliability was calculated and found to be substantial ($\kappa = 0.818$, $p < .001$). The full list of screened articles at this stage is available in Codebook 1 (Supplementary materials). A total of 196 papers were retrieved and screened in detail, with a full list available in Codebook 2 (Supplementary materials). During this second screening, 72 papers were excluded for not meeting the inclusion criteria. Additionally, some papers were excluded only after closer inspection of the full text revealed that they were theoretical in nature and did not empirically examine trust (e.g., Harvey & Laurie, 2024). This procedure reduced the number of eligible papers to 124. These papers were then analyzed using a structured coding scheme. In this second coding stage (documented in Codebook 2), each paper was coded for its research question, main findings, definition and measurement of trust, key factors examined, study type, methodology, presence of an intervention or control group, country, sample size, whether it addressed general or domain-specific trust, and additional metadata such as funding status, relevance, and type of data collection (first- or second-hand). Each study was also categorized as focusing on individual (receiver), information-message, or source-level factors.

To ensure inter-rater reliability, the second or third author read and coded each paper, after which the first author independently reviewed a randomly selected 25% of the coded studies. Discrepancies were discussed and resolved through consensus, and the dataset was finalized once full agreement was reached. Lastly, an extended coding layer was added to capture how trust was operationalized. This included how trust was measured (e.g., specific scales or proxies), what construct was being measured (e.g., trust, credibility in science or scientists), and the effect measures and effect sizes reported for associations with trust outcomes (e.g., correlation coefficients, odds ratios, standardized regression coefficients β, $\eta^2$/partial $\eta^2$). All values were extracted directly from the original publications the effect measures (e.g., correlation coefficients, odds ratios), and effect sizes where available. This information is summarized in Codebook 2 (Supplementary materials).

**Descriptive Characteristics of the Literature** Beyond the systematic coding of factors, we conducted a descriptive analysis of temporal and geographical characteristics of the included corpus. This analysis served to contextualize our findings within the broader evolution of research on trust in science and to identify potential gaps in geographical representation. For each study, publication year and country/countries of data collection (already captured in Codebook 2) were analyzed. For multinational studies where participant numbers were reported separately by country, each country was counted individually in our geographical analysis; studies reporting only aggregate multinational data were categorized as 'multinational' without country-specific coding.

**Thematic Synthesis of Factors** Our methodology of organizing findings from included studies follows Popay et al.'s (2006) guidelines for developing a preliminary synthesis in systematic literature reviews, specifically employing their thematic analysis approach to systematically identify and categorize factors across studies. The screening process is summarized in a PRISMA flow diagram in Fig. 1, and the full list of the 124 included articles is presented in Table 1 in the Appendix. For ease of reference, the included articles are cited in the following discussion in terms of their code number (column 1 in the table).

Following Popay et al.'s (2006) guidelines for narrative synthesis in systematic literature reviews, we conducted a thematic analysis to organize and synthesize the factors identified across studies. The structured coding described above (Codebook 2) provided the foundation for this analysis. Through iterative comparison of coded factors across the 124 studies, we identified three overarching thematic categories: (1) individual/receiver-level factors, (2) information-message-level factors, and (3) source-level factors. Within each category, we identified sub-themes through constant comparison and grouping of similar factors. The final thematic framework was validated by reviewing all coded studies to ensure comprehensive coverage and coherent categorization of identified factors.

The analytical framework emerging from this process—organizing factors into Receiver, Message, and Source categories—structures our presentation of results and guides our subsequent discussion of implications for research practice and science communication.

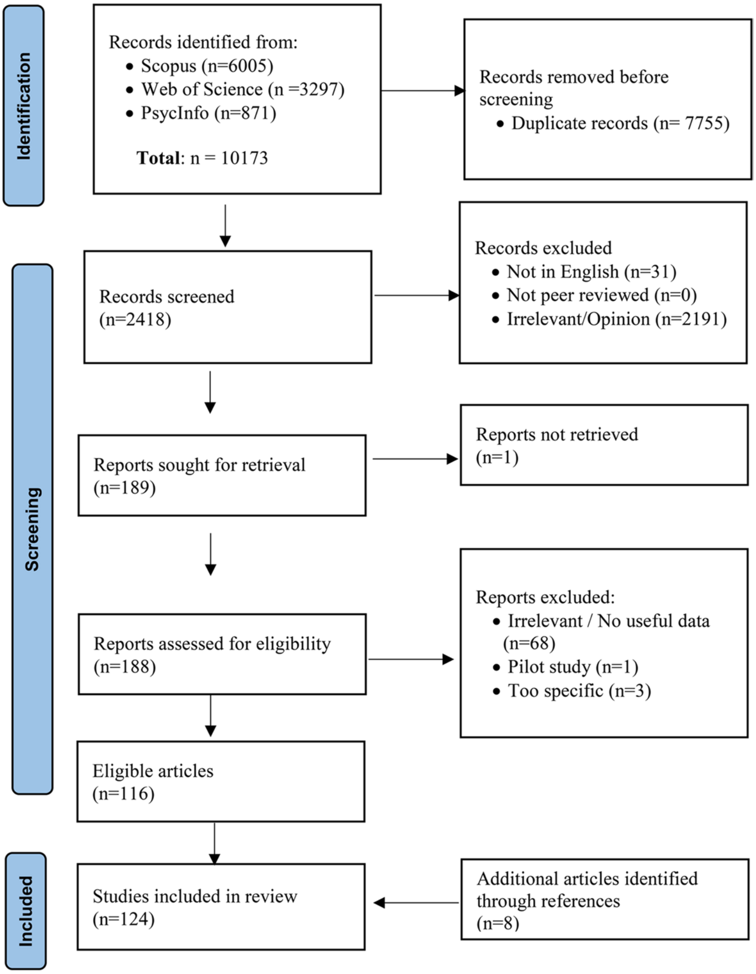


**Fig. 1** PRISMA 2020 flow diagram

## Results

The Results section is organized in two parts. First, we present descriptive characteristics of the included literature, specifically the temporal and geographical distribution of studies (Figs. 3 and 4). Second, we present our thematic synthesis of factors associated with public trust in science, organized according to the three-category framework shown in Fig. 2. As illustrated in Fig. 2, factors are categorized based on three key elements of science communication: (1) the Receiver (individual characteristics of the public), (2) the Message (science communication content, style, and channels), and (3) the Source (characteristics of scientists and the scientific method). Within each category, factors are presented based on the frequency with which they were examined across the included studies, starting with the most frequently examined. All effect sizes and statistical values reported below are as presented in the original publications.

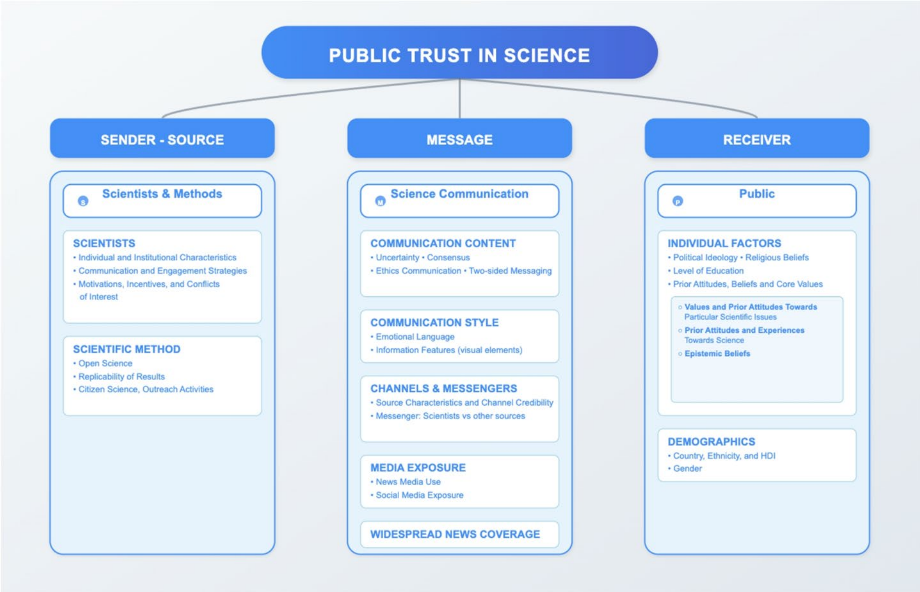


**Fig. 2** Factors Related to Trust in Science: Insights from the Current Systematic Review

## Descriptive Characteristics of the Literature

### Time and Location

Despite the fact that no time constraints were imposed in the selected search queries, our screening process resulted in articles published from 2000 onwards (see Fig. 3). Given the assumption that our corpus sufficiently represents a more complete picture, the bar plot shows that research on trust in science has increased dramatically in the years following the Covid-19 pandemic—doubled in 2020 ($n$=13), tripled in 2022 ($n$=17), and continued to grow in 2024 ($n$=19).

Regarding the geographical distribution of research on trust in science, the majority of the selected articles were based on a one study conducted in one country, however, there were also various multinational studies including data from participants from more than one country. As seen in Fig. 4, the geographical distribution of the included studies reveals significant regional concentration in trust in science research. The majority of studies originated from the United States ($n$=62, 50.00.0%), followed by Germany ($n$=18, 14.52%). Other European countries contributed to the literature, including the United Kingdom ($n$=6, 4.84%), Italy and the Netherlands ($n$=4, 3.22% each), Poland and Norway ($n$=3, 2.42% each), Switzerland ($n$=2, 1.62%), and Austria ($n$=1, 0.81%). Beyond Europe and North America, research representation was limited. Australia contributed four studies (3.22%), while New Zealand and Japan each contributed one study (0.81%). Canada and Turkey contributed two studies each (1.61% each). Only one study originated from the African continent, specifically Uganda ($n$=1, 0.81%). Seven studies (5.65%) adopted multinational approaches, examining trust in science across multiple countries, while three studies (2.42%) did not specify their geographical context.

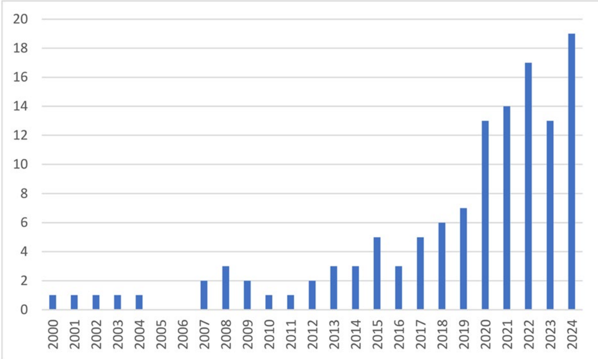


**Fig. 3** Published Articles on Trust in Science by Time (Year of Publication)

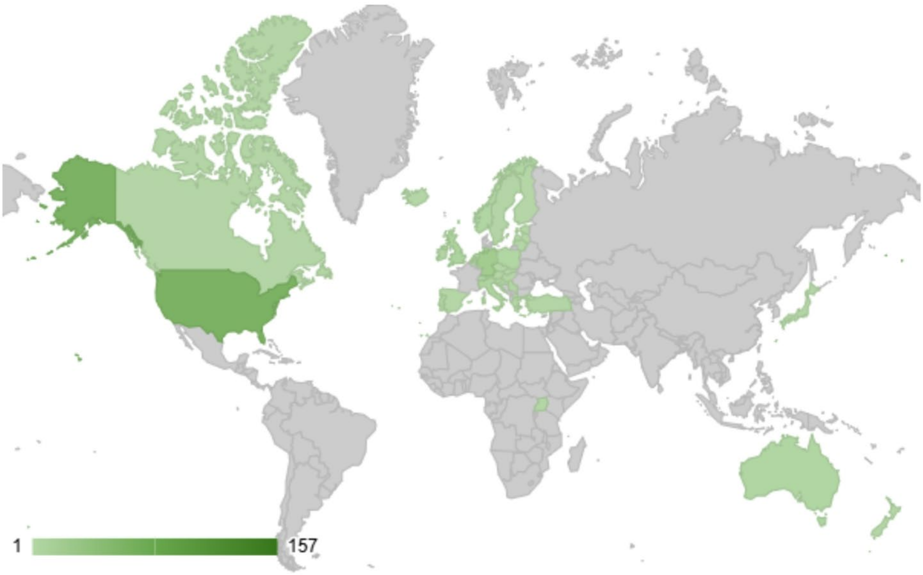


**Fig. 4** Geographical distribution of research on trust in science

## Methodological Approaches and Disciplinary Scope

The studies employed diverse methodological approaches to examine trust in science and scientists across multiple contexts. Survey-based methodologies constituted the predominant research approach, representing about 64.52% ($n=80$) of the corpus with online surveys being the most frequently employed method ($n=41$, 33.06%), followed by telephone surveys ($n=14$, 11.29%) and various other survey implementations including postal surveys, panel surveys, and specialized survey designs such as the *Eurobarometer* survey and *Gallup Poll* methodologies. Experimental designs represented the second-largest methodological category with about 20.16% ($n=25$). Secondary data analysis comprised 36 studies (29.03%), involving re-analysis of existing large-scale datasets, while qualitative methodologies were less prevalent ($n=4$, 3.22%), limited to semi-structured interviews, focus groups, and general interview approaches. Mixed-methods designs were minimally represented ($n = 1$, 0.81%), and additional methodological approaches including cross-sectional studies, online panels, and case studies accounted for the remaining studies ($n = 6$, 4.84%).

Regarding disciplinary scope, the studies demonstrated a broad focus on science communication and trust across scientific domains, with 64 studies (51.61%) examining general science or science broadly defined, while 46 studies (37.10%) focused on specific scientific disciplines or contexts. Environmental and climate sciences ($n = 14$, 11.29%) and health and medical sciences ($n = 8$, 6.45%) constituted a smaller subset within this corpus.

## Thematic Synthesis: Factors Related with Trust in Science

### Receiver: Individual Factors of Receivers of Scientific Information

The first—and most examined—category of factors related to trust in science concerns the characteristics and attributes of individuals.

**Political Ideology** The political ideology of individuals was by far the most studied factor related to trust in science within the examined articles of this review. In particular, thirty-two articles (2, 15, 16, 17, 27, 32, 35, 44, 48, 49, 50, 52, 54, 56, 60, 61, 66, 72, 85, 87, 89, 92, 93, 96, 97, 98, 99, 106, 109, 112, 119, 124) present empirical data indicating that right-wing, conservative and populist political beliefs are negatively associated with trust in science, with small to modest effect sizes (see Codebook 2 in Supplementary materials). The majority of these studies ($n = 21$) were conducted in the USA (2, 15, 32, 35, 49, 50, 52, 54, 56, 60, 61, 72, 85, 87, 89, 92, 96, 99, 109, 112, 124), seven in Europe—Germany (16, 112), Italy (17, 119), Austria (44), Norway (93) and Poland (48)—one in multiple European Countries (87), one in Germany and USA (66), two studies in Australia (97, 98), and one study is multinational including results from twenty countries (27). All studies concur that adherence to conservative political views and populist political ideology are highly correlated with lower levels of trust in science, compared to more liberal and left-wing political views.

**Level of Education** Studies examining the relationship between education level and trust in science show mixed results. While fourteen studies (16, 17, 18, 52, 60, 63, 85, 97, 98, 101, 87, 113, 118, 124) indicate that higher education correlates with greater trust in science—with effect sizes typically in the small to medium range—several studies contest this relationship (1, 9, 34, 67, 89, 111), particularly regarding controversial topics like genetic engineering and nuclear power (9). Some findings even suggest that less educated individuals may have more confidence in scientists' moral conduct (67). In study 67, in particular, respondents with lower levels of educational attainment were more likely to believe that scientists act morally and responsibly, although it remains unclear whether this translates into higher general trust in science. A 'confidence gap' has been observed where less educated people trust scientific methods but distrust scientific institutions (1). Overall, across studies, education was often included as a control or secondary variable, rather than the primary focus of investigation. The findings of the studies reviewed reflect variation depending on how trust is conceptualized, and which aspect of science is being assessed.

**Gender** Thirteen studies examined the relationship between gender and trust in science, revealing mixed results but consistently small effect sizes (see Codebook 2 in Supplementary materials). Nine studies found that men generally express higher trust in science than women (9, 36, 53, 56, 63, 68, 72, 75, 81), particularly regarding controversial research topics (9, 53). However, three studies revealed exceptions: men showed slightly lower trust in climate science, university research centers, and researchers' transparency (97, 98, 101). Scientific knowledge appears to be a key mediating factor in these gender differences. One study found that women are less likely to engage with science media such as magazines or television programs that promote informal scientific learning, resulting in comparatively lower knowledge levels on certain scientific issues (63). Notably, when women possess adequate topic knowledge—particularly among white, younger, higher socioeconomic status women—they demonstrate greater trust in science, especially regarding scientists' integrity (6, 67).

**Values and Prior Attitudes Towards Particular Scientific Issues** Multiple studies (4, 20, 23, 33, 66, 71, 72, 80, 102, 111, 114) demonstrate that people tend to trust scientific findings that align with their existing beliefs and values on particular scientific issues, with small to medium effect sizes for the influence of prior attitudes on trust judgments. For example, the more favorable an individual's attitude towards corporations, the more they trust the science of GMOs, and the more favorable an individual is towards government, the more they trust the science of climate change (66). The literature review shows that there is great variability in trust in science among different topics. Some individuals trusted researchers more when the topic was personally relevant, such as LGBTQ issues and if the scientist disclosed a personal connection to it (4) ($\beta = 0.34$, for expertise). Other studies found trust in science to be disciplined based (71, 72, 122), exhibiting for example higher trust in weather forecasting and vaccines and lower trust in climate science and genetically modified crops (97). This factor of attitudes towards particular scientific issues seems to interact with and overpower other factors that affect public trust in science, such as political orientation (61, 92) or education (9, 60). For example, study 61 found that political conservatives were more trusting of science only when its conclusions aligned with their prior beliefs.

**Religious Beliefs** Another widely studied factor concerns the religiosity of individuals with respect to their attitude towards science, with studies showing small to medium negative associations between religious commitment and science trust. Ten studies (2, 11, 15, 49, 56, 62, 65, 71, 76, 89) provide results indicating that high religious commitment and church attendance are correlated with lower levels of trust in science. Also, convergence between scientists' and individuals' religious affiliation is positively related with individuals' trust in scientists. For example, atheist participants evaluated atheist scientists as more trustworthy than scientists from various religious groups, whereas Christian participants evaluated atheist scientists as less trustworthy than religious scientists (11).

**Epistemic Beliefs** Our analysis highlighted a number of factors that fall under the umbrella of individuals' epistemic beliefs, defined as beliefs of what is knowledge and how one knows (Iordanou, 2016). Although the evidence from this line of research is limited, it provides initial insights into how epistemic beliefs and thinking relate to trust in science. For example, individuals with more sophisticated epistemic styles exhibited significantly greater trust in both climate scientists' assertions and climate science generally ($\eta^2_p = 0.06$), representing medium effect sizes (37). Similarly, individuals with higher education and valuing multiple justifications (both key components of reflexive epistemic thinking) predicted greater institutional trust in science ($\beta = 0.21$, $p < .001$, small-to-medium effect) and belief in institutional knowledge ($\beta = 1.57$, very large effect) (1).

These findings align with broader evidence that epistemic beliefs outweigh knowledge in shaping trust. Epistemic beliefs appear more influential than scientific knowledge in shaping trust. Study 31 found epistemic beliefs were stronger predictors of science trust than knowledge levels. Individuals valuing multiple-source justification were more likely to trust scientifically rigorous texts with references and neutral language (123). Those believing in public efficacy—that citizens should participate in scientific inquiry and policy—showed higher trust in genetic scientists (10). However, epistemic doubt without justification reduces trust; awareness of science's tentativeness only increased trust when paired with understanding of scientific justification (24). Conversely, conspiracy beliefs consistently undermine science trust. Multiple studies demonstrate that conspiracy ideation negatively impacts trust in science (19, 89, 105). Study 89 found conspiracy ideation significantly predicted lower trust ($\beta = -0.37$, medium-to-large effect), while study 105 revealed both direct and indirect negative effects of pandemic-related conspiracy beliefs ($\beta = -0.40$ direct, $\beta = -0.03$ indirect). Anti-vaccine conspiracy beliefs similarly predicted lower trust in COVID-19 science communication (19).

**Prior Attitudes and Experiences Towards Science** Individuals' prior attitudes towards science, that is their judgments of worthiness or favorableness (Roberts et al., 2011), is also related with their trust in science, their willingness to be vulnerable (6, 38, 68, 82, 91, 120). Across several studies, individuals with positive pre-existing attitudes or high interest in science consistently reported higher levels of trust in scientific claims, scientists, and institutions, with effect sizes ranging from small to large ($\beta = 0.04$ to 0.84). For instance, study 58, in which data were collected from 3116 individuals in pre-teen age and adulthood in USA, suggests a strong correlation between scientific interest at young ages and increased trust in climate scientists, indicating the importance of science education at young ages. Some of these studies also highlight the role of individuals' experiences in shaping their trust in science. A cross-national study of university students from Poland, the UK, and the US demonstrated that experiencing procedural fairness in academia consistently predicted greater trust in science across all three countries ($\beta = 0.35$-0.39), with this relationship being mediated by trust in scientists ($\beta = 0.72$-0.84), representing large effect sizes that suggest quality interpersonal experiences with academic scientists can significantly shape broader attitudes toward scientific institutions (6). Experiencing fairness in academia (e.g., $\beta = 0.39$) (120) and previous participation in medical research (91) ($\beta = 0.04$) have been found to be related with high trust in science.

**Country, Ethnicity, and HDI** Some studies found relations between country, ethnicity, and HDI and trust in science, with small to medium effect sizes. Study 49 explores the public trust in science in the United States by measuring the correlation between geographic residency and trust in science, and finds that rural residents exhibit comparatively low trust in science, compared with residents of urban areas. Also, study 26, a global study in twenty-two countries, found that trust in knowledge producers is inversely related to the Human

Development Index (HDI),1 with higher trust in lower HDI countries (Indonesia, Philippines, South Africa, and India) compared to higher HDI countries (Germany, USA, New Zealand, UK, Korea, Japan, Taiwan, Spain, Italy, and Estonia). Similarly, a study of one-hundred-forty-five countries (121) revealed that subjective income significantly relates to trust in science ($\beta = 0.26$), representing a small-to-medium effect size, with lower-income individuals showing less trust. Research also indicates that trust varies among racial and ethnic groups in the USA, with lowest levels among Black participants, followed by Hispanic and White participants (86), though these differences may be influenced by educational levels (101). Additionally, country-level corruption moderates the relationship between education and trust in science, with stronger trust observed in countries with low corruption (118).

## Message: Scientific Information and Delivering of Information—Science Communication

The second category of factors related to trust in science concerns science communication, the various ways in which scientific news and results are communicated to the public, and the sources of scientific information.

**Source Characteristics and Channel Credibility in Science Communication** A well-studied factor concerns the channel in which scientific information is presented to individuals, with effect sizes ranging from small to very large ($\beta = 0.06$ to $r > .84$). University students trusted textbooks most when evaluating conflicting health information, showing medium to very large effects compared to government agency texts ($r = .39$) and other sources like popular science articles and newspapers ($r > .84$) (14). Similarly, individuals consistently rank science-specific media (science television, magazines, websites) as more trustworthy than general news media for environmental information (15).

For COVID-19 information, both science trusters and distrusters preferred scientists, health ministries, and WHO as sources (59). However, general television viewing correlates with science reservations, as heavy viewers absorb televised portrayals of science without critical assessment (63). Online credibility varies by domain, with .gov sites and established institutions like NASA rated higher in expertise than commercial or generic websites (94).

**Experience with Social Media Use and Exposure to News Media** Media exposure shows complex relationships with science trust, with frequent exposure to scientific news correlating positively with trust compared to limited consumption (7, 53). Multinational data from twenty countries revealed that social media news use predicted higher pro-climate beliefs, but this effect was moderated by political ideology and social context (27). Media type and quality matter significantly, as traditional news outlets (print, radio, television) correlate with higher science trust than social media (124). Conservative media use negatively predicts trust in scientists ($b = -0.097$), while non-conservative media shows positive associations ($b = 0.171$), with lagged models confirming these effects persist over time (42). During COVID-19, social media reliance was negatively associated with science trust ($\beta = -0.35$, medium-to-large effect), partly mediated by conspiracy beliefs ($\beta = -0.15$), and those relying on influencers or conspiratorial sources showed significantly lower trust in scientists and official guidelines (105).

**Communication of Uncertainty in Scientific Results** A group of studies (37, 50, 73, 78, 83, 102) examining uncertainty communication in scientific results showed mixed findings. Some studies found that communicating uncertainty reduces trust: study 37 showed slightly lower trust in climate scientists when uncertainty was included ($\eta^2_p$ = 0.06), study 50 found that acknowledging and explaining uncertainty embedded in scientific results does not increase trust for science, concluding that categorical communication that sidesteps uncertainty is more effective at building short-term support, and study 73 found low-certainty signals decreased trust with small-to-medium effects ($d$=0.31–0.50). However, other studies found the opposite: studies 78, 83, and 102 all demonstrated that explicit uncertainty communication increased perceptions of trustworthiness, expertise, integrity, and benevolence, particularly when uncertainty statements came from the original researchers rather than unaffiliated scientists.

**Emotional Language in Science Communication** Several studies examined how emotional language affects trust in science communication. Studies 45 and 46 found that aggressive language reduced perceived expertise ($\eta^2_p$ = 0.252, large effect), integrity ($\eta^2_p$ = 0.075, medium effect), benevolence ($\eta^2_p$ = 0.174, large effect), and likability ($\eta^2_p$ = 0.247, large effect) compared to neutral tone. Enthusiastic language also decreased expertise ($\eta^2_p$ = 0.058, small-to-medium effect) and benevolence ($\eta^2_p$ = 0.028, small effect) ratings. Study 21 showed that disagreement and incivility in news stories decreased attention, acceptance, and trust in scientists, with trust highest for agreement, moderate for civil disagreement, and lowest for uncivil disagreement. Study 84 found that positive health news headlines increased hope and trust (b = 0.01, small effect), while headlines about reversals increased annoyance and reduced trust.

**Information Features in Science Communication** Several studies examined how presentation features affect trust in scientific information. Study 80 found that social media posts with hyperlinks to scientific journals or mainstream media enhanced trust compared to posts linking to “fake news” sites or without hyperlinks. Study 3 showed that brief exposure to an infographic illustrating how scientific understanding evolves—incorporating messages such as “When most scientists learn they are wrong, they are willing to change their minds, because their ultimate goal is usually to learn the truth”—produced a small but significant indirect effect on trust in science (adjusted odds ratio=1.06, $p$ =.045), particularly when viewed for at least 60 s. Study 110 demonstrated that numerical information serves as a credibility heuristic—even when participants couldn’t interpret statistics correctly, the mere presence of numbers and quantitative claims increased perceived trustworthiness.

**Messenger of Scientific Information: Scientists vs. Other Sources** Several studies examined how the public evaluates different messengers of scientific information. When comparing TV scientists to science-tubers, TV scientists were rated higher in expertise ($\eta^2$ = 0.04) but not integrity or benevolence, with integrity ratings more influenced by expert gender than messenger type (67). For scientific YouTube videos, perceived credibility was influenced by presenter credibility ($\beta$=0.48, medium-to-large effect), source integrity ($\beta$=0.17), and benevolence ($\beta$=0.14), while video popularity and viewer activity showed smaller effects (107). Viewers engaging in additional online research relied less on these heuristic cues, highlighting the role of critical media engagement. Among coastal communities, scientists and academics emerged as the most trusted messengers, followed by conservation organizations and state departments (79).

**Communication of High Consensus** Communicating scientific consensus strongly correlates with higher trust levels. Study 22 found that consensus levels above 45% significantly increased public perceptions of scientific certainty, leading to greater personal agreement and policy support compared to lower consensus levels. Notably, withholding consensus information was associated with higher certainty perceptions than reporting low consensus, suggesting people assume high consensus unless told otherwise. Study 21 confirmed this relationship by showing that when scientists were presented as agreeing, participants reported significantly higher trust in study authors, commenting scientists, and science overall compared to disagreement conditions, with trust ratings highest under agreement ($M=2.39$), followed by civil disagreement ($M=2.19$), and lowest under uncivil disagreement ($M=1.89$). Agreement conditions also led to higher evaluations of research quality and stronger acceptance of findings, demonstrating that consensus communication enhances both specific scientist trust and broader institutional trust in science.

**Ethics Communication and Two-sided Messaging in Science** Two studies examined the perceived trustworthiness of scientists when providing two-sided information (38) and when introducing the ethical aspects of a scientific research project (40). Study 38 indicates that when a source of scientific information provides two-sided information including arguments pro and contra the effectiveness of a scientific result (e.g. mask-wearing during the COVID-19 pandemic) it increases people's willingness to trust that source, compared to sources providing one-sided information with only pro arguments. Specifically, participants rated scientists higher in expertise ($\eta^2_p = 0.256$, large effect), integrity ($\eta^2_p = 0.311$, large effect), and benevolence ($\eta^2_p = 0.277$, large effect) when they acknowledged counterarguments. In addition, communicating an intent to inform rather than to persuade further increased perceptions of trustworthiness ($\eta^2_p = 0.153$, large effect vs. 0.071, medium effect), while attributing scientific motivations rather than political opinions to the scientist also positively influenced trust ($\eta^2_p = 0.090$, medium effect vs. 0.056, small-to-medium effect).

Study 40 found that when scientists themselves introduce ethical aspects of their research in science blogs, they are perceived as more trustworthy compared to when ethical aspects are introduced by other experts or prior to reading the blog. Discussing ethical implications affects perceptions of the scientist's benevolence (intention to act in others' interests) and integrity (honesty and adherence to scientific norms). Notably, when scientists themselves disclosed ethical considerations about their work, including both advantages and concerns, they received higher trustworthiness ratings than when another expert raised the same ethical points. These studies demonstrate that both the communication of ethical implications and balanced scientific messages are positively associated with public trust in science.

**Widespread News Coverage** Finally, another factor that appears to be positively correlated with higher levels of public trust in science is the widespread news coverage of scientific achievements, though this relationship likely demonstrates a small effect size (showing effects of ~0.1–0.15 SD). A large scale study in the USA (41) with data from 34,266 participants found that the widespread news coverage of the first human trial of the Zika vaccine was associated with a significant, albeit short-term, increase in trust in science. These findings are in line with the results of study 50 showing that the levels of trust in science in German citizens increased substantially after the beginning of the Covid-19 pandemic which may be partly attributed to the widespread news coverage of scientific attempts to produce a new vaccine. These findings suggest that trust in science may be bolstered by widespread communication of major scientific achievements. However, this relationship appears complex and context-dependent, as the COVID-19 pandemic demonstrated that widespread coverage of scientific developments can also generate controversy and skepticism, evidenced by vaccine hesitancy among certain populations.

### Source: Creation of Scientific Information: Scientists and the Scientific Method

The third category of identified factors to the public trust in science concerns the characteristics of the scientific method per se and the characteristics of the scientists involved in research.

**Scientists' Motivations, Incentives, and Conflicts of Interest Affecting Perceived Trustworthiness of Scientists** Scientists perceived motivations and potential conflicts of interest significantly influence public trust. Study 5 found that scientists expressing self-criticism and reform intentions were rated significantly higher in integrity ($\eta^2$ = 0.36, large effect), benevolence ($\eta^2$ = 0.32, large effect), and expertise ($\eta^2$ = 0.23, large effect), and this positively affected participants' willingness to engage with their research. In a similar manner, study 39 found that scientists who disclosed a flaw in their work were perceived as more trustworthy, with higher integrity ($r$ = .47, medium-to-large effect), benevolence ($r$ = .33, medium effect), and expertise ($r$ = .19, small-to-medium effect). Study 25 revealed that scientists working in public universities are perceived as more trustworthy and benevolent than those in private companies, though perceived expertise is not affected by whether a scientist works for a private company or a public university. Supporting these findings, study 13 demonstrated that communal (prosocial) motivations predicted higher trust in science ($\beta$ =0.32, $p < .001$, medium effect), while agentic (self-oriented) motivations predicted lower trust ($\beta$ = –0.20, $p < .001$, small-to-medium effect).

Similarly, study 28 found scientists to be the most trusted sources of information about environmental risks, primarily because they are perceived as lacking motives to distort information, unlike other stakeholders such as land developers. Study 55 further confirmed that conflicts of interest negatively correlate with trust in scientific information. Similarly, study 117 found that public trust in science during the pandemic was highest when scientists were perceived as highly competent and independent of partisan influence. Perceptions of close ties to political figures reduced trust. Study 29 supports these findings by showing that although climate scientists are generally not strongly distrusted, the perceived motive to gain research fundings stands out as a reason for public skepticism. Conversely, scientists were more trusted when they were perceived as motivated to educate the public, save humanity, or protect the environment, underscoring the role of clearly communicated prosocial intentions.

Together, these studies suggest that public trust in scientists is strongly influenced by their perceived motivations and political and institutional affiliations, with higher trust associated with pro-social motives and independence from private interests.

**Individual and Institutional Characteristics of Perceived Trustworthiness of Scientists** Among studies examining source credibility there is consensus that scientists are the most trustworthy source of scientific information. Study 45 found that when a debater was introduced as a lobbyist rather than a scientist, they were rated significantly lower in expertise ($\eta_p^2 = 0.252$, large effect), integrity ($\eta_p^2 = 0.075$, medium effect), and benevolence ($\eta_p^2 = 0.174$, large effect), even though both communicators used the same arguments. Interestingly, expertise perceptions remained robust when the communicator was described as a scientist but dropped significantly for lobbyists using enthusiastic language. Similarly, study 47 showed that when a lobbyist reported self-conducted studies, their credibility dropped significantly compared to when citing other scientists' work ($\eta^2 = 0.043$, small effect), highlighting the role of perceived conflict of interest in damaging trust.

Studies examining the characteristics of scientists that make them appear more or less trustworthy when they communicate scientific information to the public identified scientists' affiliation as a key factor. Those working in public universities are perceived as more trustworthy than those in private companies (25, 46). However, 115 found that within academic institutions, the prestige of the affiliated university did not significantly affect scientists' credibility.

Another interesting finding comes from study 67 which compares the perceived trustworthiness of scientists as science communicators according to their gender and age. The study reports that viewing a stimulus featuring a female STEM expert as opposed to a male expert and viewing an older as opposed to a younger expert has positive and significant effect on perceived expertise, which further determines trustworthiness. Further evidence for women scientists come from study 103 which found that female scientists were consistently rated as more likable than male scientists regardless of their communication approach, and maintained equal perceived competence to their male counterparts. Expertise is, therefore, a crucial factor in trustworthiness, but gender and age can also shape how expertise is perceived by audiences. Another factor related to science communicators studied in 57 concerns the community reputation of the scientist. The study shows that scientists with good community reputation are perceived as more trustworthy by the members of this community. Hence, according to these findings, the most trustworthy messengers of scientific information are older, female scholars who work in public Universities, and have good community reputation, although more research is needed to validate these results.

**Communication and Engagement Strategies Affecting Scientists' Perceived Trustworthiness** Other factors that research shows to shape public perception of scientists' trustworthiness include their communication style, biographical presentation, and level of advocacy engagement. Study 103 found that personal disclosures (e.g., family background, motivations) led to higher likability ratings ($\eta^2 = 0.022$, small effect), while political disclosures, such as revealing personal stances on climate policy, enhanced perceived competence ($\eta^2 = 0.008$, very small effect), suggesting that even controversial political expressions can enhance perceived expertise. When scientists highlight their prosocial motivations and benevolence in biographical materials, this increases perceptions of both their benevolence and integrity, although it does not affect competence ratings (100). Regarding activism and advocacy, scientists engaging in civil disobedience can increase public perception of climate risks' seriousness without sacrificing their credibility, though this may not translate into increased public intention to take climate action (115). Scientists can generally engage in policy advocacy without damaging their credibility, with the notable exception that advocating for controversial solutions like nuclear power may somewhat reduce perceived credibility (104). The benefits of personalization should not be overstated, though, —one study found that merely personalizing the writing style of climate science texts had negligible impact on either the writer's perceived credibility or readers' attitudes toward climate issues (116). Study 108 found that scientists who consult with relevant non-scientists are perceived as more trustworthy, competent, and objective. Conversely, scientists working under restrictive governmental policies are seen as less credible, while labs receiving government funding are viewed as more credible, regardless of corporate funding. Hence, how scientists are presented to the public can influence public trust in them and their messages.

### Characteristics of Perceived Trustworthiness of the Scientific Method

**Open Science & Replicability of Results** Three studies (69, 74, 77) clearly indicate that the public perceives open science research and researchers both as more credible and trustworthy than non-open science counterparts. Study 77 found that research adhering to open science practices was rated significantly higher in expertise (partial $\eta^2 = 0.173$, large effect), integrity (partial $\eta^2 = 0.133$, medium effect), and benevolence (partial $\eta^2 = 0.170$, large effect) than research not following open practices. Similarly, scientific content associated with open science was seen as more trustworthy ($d = 0.39$, small-to-medium effect) and credible ($d = 0.46$, medium effect). Conversely, study 8 underscores the risks of failed replication. Participants who read about replication failures exhibited lower trust in both past ($d = 0.36$, small-to-medium effect) and future research ($d = 0.16$, small effect), even though these effects did not always reach statistical significance.

**Citizen Science, Outreach Activities & Involvement in Decision Making** Several studies examined how citizen participation affects trust in science. Study 12 found that citizen participation in research increases public trust in study results compared to traditional academic research. Study 51 showed outreach activities significantly increased trust, but only for students with initially low trust levels (partial $\eta^2 = 0.164$–$0.291$, large effects), with no changes for those with higher initial trust. Study 64 found that most participants consider involvement in decision-making about health data sharing crucial for trust in research, though those with low institutional trust and education attributed less importance to involvement. Study 95 demonstrated that a Dutch citizen science project measuring air pollution enhanced participants' trust in scientific processes and local governance when the process was transparent and scientists were approachable and empathetic, though it didn't improve trust between opposing stakeholders. These studies suggest citizen involvement can enhance trust in science, particularly for those with initially low trust, with transparency and approachable scientists being key factors.

## Discussion

This systematic literature review aimed to identify factors associated with public trust in science to provide insights for strengthening science-society relationships. By synthesizing 124 empirical studies into a coherent framework, our analysis responds to the fragmentation observed in the literature—where research remains scattered across domains and disciplines. The three-category organizational structure (Receiver-Message-Source) that emerged from our thematic analysis, as illustrated in Fig. 2, captures the complexity of trust in science as a multifaceted, multi-actor, and context-dependent phenomenon, as conceptualized in our theoretical framework.

Regarding the individual factors, our review identified the following factors the effect of which has been studied on the public trust in science: political ideology, prior attitudes, beliefs and values, experience with social/news media, epistemic beliefs, and demographics. Studies examining individual factors show that political ideology is frequently studied in relation to trust in science, with multiple studies indicating differences in trust levels between conservatives and liberals, particularly in the US context. However, the strength of these associations requires further investigation through meta-analytic approaches, as our review methodology does not allow us to make claims about the magnitude of these relationships. Epistemic thinking, on the other hand, is highly correlated with higher levels of trust in science, although limited studies examined this relation. Some other variables, such as religious commitment, prior attitudes, and values, are related with *who* the public trust, rather than trust in science in general, with individuals basing their judgments on a scientist's trustworthiness on the degree of alignment between their own and the scientists' views. Most of the studies examining the role of education suggest that the level of education is related with high trust in science, but this is also very topic-specific.

Regarding the communication of scientific information, our review shows that several strategies are associated with higher trust in scientific information: communicating scientific consensus, presenting balanced two-sided arguments that acknowledge both pros and cons, using neutral rather than aggressive or enthusiastic language, incorporating infographics that explain the scientific method, and including hyperlinks to scientific journals when sharing information on social media. However, the evidence base for these communication strategies remains limited, and more empirical research is needed to establish their effectiveness across different contexts. Regarding communicating uncertainty there are mixed findings, more research is needed to examine under which conditions and how communicating uncertainty benefits public views of the trustworthiness of scientists and science. Concerning the channel of scientific information textbooks, science television, science magazines, and science websites are considered the most trustworthy channels. Widespread news coverage of scientific achievements is also positively related with higher levels of public trust in science.

Concerning development of scientific knowledge—scientists and the method used—the category of factors which received the least attention in the literature, our review showed that scientists and academics are conceived as the most trustworthy sources followed by state institutions such as the Ministry of Health and World Health Organization. Our findings further indicate that how scientists communicate (e.g., acknowledging uncertainty, using balanced messaging) also matters for trust, suggesting that any increased engagement should be accompanied by appropriate communication training and support. Trust in scientists seem to be also affected by a combination of perceived expertise and perceived motives, including scientists' incentives and conflict of interest. Regarding the scientific method, the replicability crisis seems to affect negatively public trust in science, whereas practices which safeguard integrity in research such as open science, are positively related with public trust in science. Our review also suggests that involving citizens in scientific processes can enhance trust in science, particularly among those with initially low trust levels. Process transparency, consideration of participants' interests, and approachable scientists appear to contribute to building public trust, though more research is needed to determine the relative importance of these factors.

Consistent with the challenges outlined in our Introduction regarding the fragmented nature of trust research, our geographical analysis revealed that half of the studies examining public trust in science that have been reviewed here have been conducted in the USA and approximately the other half in Western Europe. Given that these findings represent mostly Western contexts, we should be cautious in generalizing these findings. There is clearly a need for studying these constructs in regions currently underrepresented in the literature, particularly across Asia, Africa, South America, Eastern Europe, and the Middle East, where few or no studies have been conducted according to our analysis, as well as among different groups. Additionally, the conclusions drawn in the current review are limited by the small number of studies investigating specific factors. Many of these findings have yet to be replicated, further restricting the generalizability of our conclusions.

An underexplored yet important issue concerns the varying levels of trust in science depending on the scientific field under consideration, especially given findings that epistemic trust is domain-specific (Iordanou, 2016); "hard" sciences (e.g., genetics, materials science) consistently rated as more trustworthy than social sciences (e.g., economics, education studies) (Younger-Khan et al., 2024). Our findings are aligned with Fage-Butler et al.'s (2022), who also noted the lack of disciplinary situatedness of the research of trust in science. The variation in public's trust across different scientific topics and contexts highlights the need for more research to identify fields and scientific topics where public trust in science is lower and examine the underlying reasons why these particular fields, or topics, might be less trustworthy for some individuals.

Furthermore, our review identified gaps in our understanding of how different factors may interact affecting public trust in science. The studies examining the issue of trust in science have focused on only one dimension of the relationship, either on individual factors of the recipients of the information, or the information itself and its delivery or the developers of the scientific information, and the method they used. For example, participants in many surveys were often asked to evaluate the characteristics of trustworthy scientists, as the agents and representatives of science, and determine the most trustworthy source of scientific information regardless of the content of the information. A notable absence in our findings is studies which appreciate the complexity of the issue, examining how different individual variables interact with the scientific information and the source of the information —scientists—under different conditions. While several studies in our review examined multiple factors simultaneously within one dimension (e.g., multiple individual characteristics), future research would benefit from more comprehensive approaches that systematically examine factors across different dimensions—such as simultaneously investigating individual characteristics, communication strategies, and methodological factors—to better understand their interactive effects on trust in science.

While this study provides valuable insights into the factors affecting trust in science, several limitations should be acknowledged. First, while our search strategy identified 124 relevant papers, the relatively narrow search terms used (focusing on "trust," "science," and related terms in titles) means we may have missed relevant studies using different terminology. Additionally, our search strategy was restricted to keywords appearing only in publication titles. This methodological decision follows precedent established in similar systematic reviews (e.g., Lazić & Žeželj, 2021) and was chosen to deal with the tremendous amount of papers that our search keywords yield. Nevertheless, future studies could extend the search to include both titles and abstracts, potentially capturing relevant literature that our methodology may have missed. Finally, our study, which focused on empirical examinations of factors affecting public trust in science, might have missed factors or interactions that are evident through other methodologies.

More research is needed appreciating the complexity of the issue, and taking a multi-variable approach when studying public trust in science. There is a need to examine the effect not only of particular characteristics, focusing for example on individual traits at the individual level, but also how the interaction of different traits within an individual, but also interaction between individuals at the social level (Hendriks et al. 2020a), affect trust in science. Also, meta-analytic approaches would help better understand the strength of relationships between various factors and trust in science.

The findings of the systematic literature review have important implications for education. Given the relationship between epistemic beliefs and trust in science, it is essential for educational systems to promote the development of individuals' epistemic beliefs. There is a need for targeted intervention programs that support the development of epistemic perspectives that appreciate the complexity of real-world issues, cultivate multivariable thinking, and foster appreciation for both the tentative nature of scientific knowledge and the value of trustworthy evidence (Iordanou, 2022; Iordanou & Kuhn, 2025; Kuhn & Iordanou, 2022; Kuhn et al., 2008)—elements that are fundamental to public trust in science.

## Public Trust in Science and Responsible Research

Our systematic literature review has important implications for understanding and fostering public trust in scientific knowledge and responsible research—the central concern of this special issue. The findings underscore that responsible research lies at the cornerstone of public trust in science. Scientists' perceived integrity, epistemic practices that support transparency, and epistemic inclusion are all fundamentally related to public trust in science. The public trust scientists who demonstrate pro-social motives—including having no conflicts of interest—employ epistemic practices that support transparency, show intellectual humility by disclosing ethical considerations and concerns about their work, and practice epistemic inclusivity. Epistemic inclusivity involves inclusiveness both within the scientific community itself (Koch, 2020) and between scientists and stakeholders outside formal science (Varda et al., 2025; Zwart et al., 2024).

Some of these practices are admittedly challenging to implement, as they involve fundamental belief and attitude changes. For example, promoting gender inclusivity within science—in light of the finding that female scientists are considered more trustworthy, which aligns with other research (Zarzeczna et al., 2024)—requires overcoming the current male-dominated field (Koch, 2020) and enabling women scientists to pursue more visible leadership roles and positions within STEM organizations. Institutional transformations could further support epistemic inclusiveness through closer collaboration between scientists and citizens. An institutional culture where public engagement is expected and celebrated—for instance, by incorporating it into evaluation criteria—would facilitate scientists' public engagement. Finally, targeted education programs can enhance researchers' research integrity skills, creating a foundation for more trustworthy scientific practice.

The present systematic literature review contributes to the urgent call to identify determinants of public trust in an era when science faces unprecedented challenges and public skepticism. The synthesis of the literature provides further evidence that public trust in science has a complex, multifaceted, multi-actor, and context-dependent nature (Iordanou, et al., in press). Future research must acknowledge this complexity both when studying public trust and when developing strategies to safeguard and enhance it. The factors we have identified—spanning individual characteristics, communication practices, and scientific methods—provide the scientific community with evidence-informed tools to 'stand for science,' as called for by professional organizations (Korte, 2025; APA, 2025). Ultimately, by embracing responsible research practices that prioritize transparency, inclusivity, and genuine dialogue between scientists and society, we can strengthen public trust in science and enhance our collective capacity to address the pressing societal and environmental challenges of our time.

## Appendix

**Table 1** References for studies included in this literature review

| No. | Reference |
|---|---|
| 1 | Achterberg, P., De Koster, W., & Van der Waal, J. (2015). A science confidence gap: Education, trust in scientific methods, and trust in scientific institutions in the United States, 2014. *Public Understanding of Science*, *26*(6), 704–720. |
| 2 | Agley, J. (2020). Assessing changes in US public trust in science amid the COVID-19 pandemic. *Public health*, *183*, 122–125. |
| 3 | Agley, J., Xiao, Y., Thompson, E. E., Chen, X., & Golzarri-Arroyo, L. (2021). Intervening on trust in science to reduce belief in COVID-19 misinformation and increase COVID-19 preventive behavioral intentions: randomized controlled trial. *Journal of Medical Internet Research*, *23*(10), e32425. |
| 4 | Altenmüller, M. S., Lange, L. L., & Gollwitzer, M. (2021). When research is me-search: How researchers' motivation to pursue a topic affects laypeople's trust in science. *Plos one*, *16*(7), e0253911. |
| 5 | Altenmüller, M. S., Nuding, S., & Gollwitzer, M. (2021). No harm in being self-corrective: Self-criticism and reform intentions increase researchers' epistemic trustworthiness and credibility in the eyes of the public. *Public understanding of science*, *30*(8), 962–976. |
| 6 | Anderson, A. A., Scheufele, D. A., Brossard, D., & Corley, E. A. (2012). The role of media and deference to scientific authority in cultivating trust in sources of information about emerging technologies. *International Journal of Public Opinion Research*, *24*(2), 225–237. |
| 7 | Andersson, U. (2015). Does media coverage of research misconduct impact on public trust in science? A study of news reporting and confidence in research in Sweden 2002–2013. *Observatorio (OBS*)*, *9*(4). |
| 8 | Anvari, F., & Lakens, D. (2018). The replicability crisis and public trust in psychological science. *Comprehensive Results in Social Psychology*, *3*(3), 266–286. |
| 9 | Bak, H. J. (2001). Education and public attitudes toward science: Implications for the "deficit model" of education and support for science and technology. *Social Science Quarterly*, *82*(4), 779–795. |
| 10 | Barnett, J., Cooper, H., & Senior, V. (2007). Belief in public efficacy, trust, and attitudes toward modern genetic science. *Risk Analysis: An International Journal*, *27*(4), 921–933. |
| 11 | Beauchamp, A. L., & Rios, K. (2020). Secularism in science: The role of religious affiliation in assessments of scientists' trustworthiness. *Public Understanding of Science*, *29*(2), 194–210. |

**Table 1** (continued)


| No. | Reference |
| --- | --- |
| 12 | Bedessem, B., Gawronska-Nowak, B., & Lis, P. (2021). Can citizen science increase trust in research? A case study of delineating Polish metropolitan areas. *Journal of Contemporary European Research*, *17*(2), 305–321. |
| 13 | Benson-Greenwald, T. M., Trujillo, A., White, (A) D., & Diekman, A. (B) (2023). Science for others or the self? Presumed motives for science shape public trust in science. *Personality and Social Psychology Bulletin*, *49*(3), 344–360. |
| 14 | Bråten, I., Braasch, J. L., Strømsø, H. I., & Ferguson, L. E. (2015). Establishing trustworthiness when students read multiple documents containing conflicting scientific evidence. *Reading Psychology*, *36*(4), 315–349. |
| 15 | Brewer, P. R., & Ley, B. L. (2013). Whose science do you believe? Explaining trust in sources of scientific information about the environment. *Science Communication*, *35*(1), 115–137. |
| 16 | Bromme, R., Mede, N. G., Thomm, E., Kremer, B., & Ziegler, R. (2022). An anchor in troubled times: Trust in science before and within the COVID-19 pandemic. *PloS one*, *17*(2), e0262823. |
| 17 | Cadeddu, C., Daugbjerg, S., Ricciardi, W., & Rosano, A. (2020). Beliefs towards vaccination and trust in the scientific community in Italy. *Vaccine*, *38*(42), 6609–6617. |
| 18 | Cadeddu, C., Sapienza, M., Castagna, C., Regazzi, L., Paladini, A., Ricciardi, W., & Rosano, A. (2021). Vaccine hesitancy and trust in the scientific community in Italy: comparative analysis from two recent surveys. *Vaccines*, *9*(10), 1206. |
| 19 | Capasso, M., Caso, D., & Zimet, G. D. (2022). The mediating roles of attitude toward COVID-19 vaccination, trust in Science and trust in Government in the relationship between anti-vaccine conspiracy beliefs and vaccination intention. *Frontiers in psychology*, *13*, 936,917. |
| 20 | Carlisle, J. E., Feezell, J. T., Michaud, K. E., Smith, E. R., & Smith, L. (2010). The public's trust in scientific claims regarding offshore oil drilling. *Public Understanding of Science*, *19*(5), 514–527. |
| 21 | Chinn, S., & Hart, P. S. (2022). Can't you all just get along? Effects of scientific disagreement and incivility on attention to and trust in science. *Science Communication*, *44*(1), 108–129. |
| 22 | Chinn, S., Lane, D. S., & Hart, P. S. (2018). In consensus we trust? Persuasive effects of scientific consensus communication. *Public Understanding of Science*, *27*(7), 807–823. |
| 23 | Clobert, M., & Saroglou, V. (2015). Religion, paranormal beliefs, and distrust in science: Comparing East versus West. *Archive for the Psychology of Religion*, *37*(2), 185–199. |
| 24 | Cobern, W. W., Adams, B. A., Pleasants, B. A., Bentley, A., & Kagumba, R. (2022). Do we have a trust problem? Exploring undergraduate student views on the tentativeness and trustworthiness of science. *Science & education*, 1–30. |
| 25 | Critchley, C. R. (2008). Public opinion and trust in scientists: the role of the research context, and the perceived motivation of stem cell researchers. *Public Understanding of Science*, *17*(3), 309–327. |
| 26 | de Zúñiga, H. G., Ardèvol-Abreu, A., Diehl, T., Patiño, M. G., & Liu, J. H. (2019). Trust in institutional actors across 22 countries. Examining political, science, and media trust around the world. *Revista Latina de Comunicación Social*, (74), 237–262. |
| 27 | Diehl, T., Huber, B., Gil de Zúñiga, H., & Liu, J. (2021). Social media and beliefs about climate change: a cross-national analysis of news use, political ideology, and trust in science. *International Journal of Public Opinion Research*, *33*(2), 197–213. |
| 28 | Eiser, J. R., Stafford, T., Henneberry, J., & Catney, P. (2009). "Trust me, I'm a scientist (not a developer)": Perceived expertise and motives as predictors of trust in assessment of risk from contaminated land. *Risk Analysis: An International Journal*, *29*(2), 288–297. |
| 29 | Fiske, S. T., & Dupree, C. (2014). Gaining trust as well as respect in communicating to motivated audiences about science topics. *Proceedings of the National Academy of Sciences*, *111*(supplement_4), 13,593–13,597. |
| 30 | Fukasawa, M., Kawakami, N., Umeda, M., Akiyama, T., Horikoshi, N., Yasumura, S., … & Bromet, E. J. (2020). Long-lasting effects of distrust in government and science on mental health eight years after the Fukushima nuclear power plant disaster. *Social Science & Medicine*, *258*, 113,108. |

**Table 1** (continued)

| No. | Reference |
| --- | --- |
| 31 | Gauchat, G. (2011). The cultural authority of science: Public trust and acceptance of organized science. *Public understanding of science*, *20*(6), 751–770. |
| 32 | Gauchat, G. (2012). Politicization of science in the public sphere: A study of public trust in the United States, 1974 to 2010. *American sociological review*, *77*(2), 167–187. |
| 33 | Gierth, L., & Bromme, R. (2020). Attacking science on social media: How user comments affect perceived trustworthiness and credibility. *Public Understanding of Science*, *29*(2), 230–247. |
| 34 | Groeniger, J. O., Noordzij, K., Van Der Waal, J., & De Koster, W. (2021). Dutch COVID-19 lockdown measures increased trust in government and trust in science: A difference-in-differences analysis. *Social Science & Medicine*, *275*, 113,819. |
| 35 | Hamilton, L. C., & Safford, T. G. (2021). Elite cues and the rapid decline in trust in science agencies on COVID-19. *Sociological Perspectives*, *64*(5), 988–1011. |
| 36 | Hayes, B. C., & Tariq, V. N. (2000). Gender differences in scientific knowledge and attitudes toward science: a comparative study of four Anglo-Americannations. *Public Understanding of Science*, *9*(4), 433. |
| 37 | Hendriks, F., & Jucks, R. (2020). Does scientific uncertainty in news articles affect readers' trust and decision-making? *Media and Communication*, *8*(2), 401–412. |
| 38 | Hendriks, F., Janssen, I., & Jucks, R. (2023). Balance as credibility? How presenting one-vs. two-sided messages affects ratings of scientists' and politicians' trustworthiness. *Health communication*, *38*(12), 2757–2764. |
| 39 | Hendriks et al., (2016). Disclose your flaws! Admission positively affects the perceived trustworthiness of an expert science blogger. *Studies in Communication Sciences*, *16*(2), 124–131. |
| 40 | Hendriks et al., (2016). Evoking vigilance: Would you (dis) trust a scientist who discusses ethical implications of research in a science blog? *Public Understanding of Science*, *25*(8), 992–1008. |
| 41 | Hilgard, J., & Jamieson, K. H. (2017). Does a scientific breakthrough increase confidence in science? News of a Zika vaccine and trust in science. *Science Communication*, *39*(4), 548–560. |
| 42 | Hmielowski, J. D., Feldman, L., Myers, T. A., Leiserowitz, A., & Maibach, E. (2014). An attack on science? Media use, trust in scientists, and perceptions of global warming. *Public Understanding of Science*, *23*(7), 866–883. |
| 43 | Huber, B., Barnidge, M., Gil de Zúñiga, H., & Liu, J. (2019). Fostering public trust in science: The role of social media. *Public understanding of science*, *28*(7), 759–777. |
| 44 | Huber, R. A., Greussing, E., & Eberl, J. M. (2022). From populism to climate scepticism: the role of institutional trust and attitudes towards science. *Environmental Politics*, *31*(7), 1115–1138. |
| 45 | König and Jucks (2019). Hot topics in science communication: Aggressive language decreases trustworthiness and credibility in scientific debates. *Public understanding of science*, *28*(4), 401–416. |
| 46 | König and Jucks (2019). Influence of enthusiastic language on the credibility of health information and the trustworthiness of science communicators: Insights from a between-subject web-based experiment. *Interactive Journal of Medical Research*, *8*(3), e13619. |
| 47 | König and Jucks (2019). When do information seekers trust scientific information? Insights from recipients' evaluations of online video lectures. *International Journal of Educational Technology in Higher Education*, *16*(1), 1. |
| 48 | Kossowska, M., Szwed, P., & Czarnek, G. (2021). Ideology shapes trust in scientists and attitudes towards vaccines during the COVID-19 pandemic. *Group Processes & Intergroup Relations*, *24*(5), 720–737. |
| 49 | Krause, N. M., Brossard, D., Scheufele, D. A., Xenos, M. A., & Franke, K. (2019). Trends—Americans' trust in science and scientists. *Public Opinion Quarterly*, *83*(4), 817–836. |
| 50 | Kreps, S. E., & Kriner, D. L. (2020). Model uncertainty, political contestation, and public trust in science: Evidence from the COVID-19 pandemic. *Science advances*, *6*(43), eabd4563. |
| 51 | Krüger, J. T., Höffler, T. N., & Parchmann, I. (2022). Trust in science and scientists among secondary school students in two out-of-school learning activities. *International Journal of Science Education*, *Part B*, *12*(2), 111–125. |

**Table 1** (continued)

| No. | Reference |
|---|---|
| 52 | Hamilton, L. C., Hartter, J., & Saito, K. (2015). Trust in scientists on climate change and vaccines. *Sage Open*, *5*(3), 2,158,244,015,602,752. |
| 53 | Liu, H., & Priest, S. (2009). Understanding public support for stem cell research: media communication, interpersonal communication and trust in key actors. *Public Understanding of science*, *18*(6), 704–718. |
| 54 | Mann, M., & Schleifer, C. (2020). Love the science, hate the scientists: Conservative identity protects belief in science and undermines trust in scientists. *Social Forces*, *99*(1), 305–332. |
| 55 | McComas, K. A. (2008). Session 5: Nutrition communication The role of trust in health communication and the effect of conflicts of interest among scientists: Symposium on 'The challenge of translating nutrition research into public health nutrition'. *Proceedings of the Nutrition Society*, *67*(4), 428–436. |
| 56 | McCright, A. M., Dentzman, K., Charters, M., & Dietz, T. (2013). The influence of political ideology on trust in science. *Environmental Research Letters*, *8*(4), 044029. |
| 57 | Millar, E., Melles, S., Klug, J. L., & Rees, T. (2023). Stewarding relations of trust: citizen scientist perspectives on fostering community trust in science. *Environmental Sociology*, *9*(1), 31–50. |
| 58 | Motta, M. (2018). The enduring effect of scientific interest on trust in climate scientists in the United States. *Nature Climate Change*, *8*(6), 485–488. |
| 59 | Muğaloğlu, E. Z., Kaymaz, Z., Mısır, M. E., & Laçin-Şimşek, C. (2022). Exploring the role of trust in scientists to explain health-related behaviors in response to the COVID-19 pandemic. *Science & Education*, *31*(5), 1281–1309. |
| 60 | Myers, T. A., Kotcher, J., Stenhouse, N., Anderson, A. A., Maibach, E., Beall, L., & Leiserowitz, A. (2017). Predictors of trust in the general science and climate science research of US federal agencies. *Public Understanding of Science*, *26*(7), 843–860. |
| 61 | Nisbet, E. C., Cooper, K. E., & Garrett, R. K. (2015). The partisan brain: How dissonant science messages lead conservatives and liberals to (dis) trust science. *The ANNALS of the American Academy of Political and Social Science*, *658*(1), 36–66. |
| 62 | Nisbet, M. C., & Goidel, R. K. (2007). Understanding citizen perceptions of science controversy: bridging the ethnographic—survey research divide. *Public Understanding of science*, *16*(4), 421–440. |
| 63 | Nisbet, M. C., Scheufele, D. A., Shanahan, J., Moy, P., Brossard, D., & Lewenstein, B. V. (2002). Knowledge, reservations, or promise? A media effects model for public perceptions of science and technology. *Communication research*, *29*(5), 584–608. |
| 64 | Nwebonyi, N., Silva, S., & De Freitas, C. (2022). Public views about involvement in decision-making on health data sharing, access, use and reuse: the importance of trust in science and other institutions. *Frontiers in Public Health*, *10*, 852,971. |
| 65 | O'Brien, T. L., & Noy, S. (2018). Cultural authority in comparative context: A multilevel analysis of trust in science and religion. *Journal for the Scientific Study of Religion*, *57*(3), 495–513. |
| 66 | Pechar, E., Bernauer, T., & Mayer, F. (2018). Beyond political ideology: The impact of attitudes towards government and corporations on trust in science. *Science Communication*, *40*(3), 291–313. |
| 67 | Reif, A., Kneisel, T., Schäfer, M., & Taddicken, M. (2020). Why are scientific experts perceived as trustworthy? Emotional assessment within TV and YouTube videos. *Media and Communication*, *8*(1), 191–205. |
| 68 | Roberts, M. R., Reid, G., Schroeder, M., & Norris, S. P. (2013). Causal or spurious? The relationship of knowledge and attitudes to trust in science and technology. *Public Understanding of Science*, *22*(5), 624–641. |
| 69 | Rosman, T., Bosnjak, M., Silber, H., Koßmann, J., & Heycke, T. (2022). Open science and public trust in science: Results from two studies. *Public Understanding of Science*, *31*(8), 1046–1062. |
| 70 | Rowland, J., Estevens, J., Krzewińska, A., Warwas, I., & Delicado, A. (2022). Trust and mistrust in sources of scientific information on climate change and vaccines: Insights from Portugal and Poland. *Science & education*, *31*(5), 1399–1424. |

**Table 1** (continued)

| No. | Reference |
|---|---|
| 71 | Sarathchandra, D., & Haltinner, K. (2021). A survey instrument to measure skeptics'(dis) trust in climate science. *Climate*, *9*(2), 18. |
| 72 | Sarathchandra, D., & Haltinner, K. (2020). Trust/distrust judgments and perceptions of climate science: A research note on skeptics' rationalizations. *Public Understanding of Science*, *29*(1), 53–60. |
| 73 | Schneider, C. R., Freeman, A. L., Spiegelhalter, D., & van der Linden, S. (2022). The effects of communicating scientific uncertainty on trust and decision making in a public health context. *Judgment and Decision Making*, *17*(4), 849–882. |
| 74 | Schneider, J., Rosman, T., Kelava, A., & Merk, S. (2022). Do open-science badges increase trust in scientists among undergraduates, scientists, and the public? *Psychological Science*, *33*(9), 1588–1604. |
| 75 | Schoor, C., & Schütz, A. (2021). Science-utility and science-trust associations and how they relate to knowledge about how science works. *Plos one*, *16*(12), e0260586. |
| 76 | Simpson, A., & Rios, K. (2019). Is science for atheists? Perceived threat to religious cultural authority explains US Christians' distrust in secularized science. *Public Understanding of Science*, *28*(7), 740–758. |
| 77 | Song, H., Markowitz, D. M., & Taylor, S. H. (2022). Trusting on the shoulders of open giants? Open science increases trust in science for the public and academics. *Journal of Communication*, *72*(4), 497–510. |
| 78 | Steijaert, M. J., Schaap, G., & Riet, J. V. T. (2021). Two-sided science: Communicating scientific uncertainty increases trust in scientists and donation intention by decreasing attribution of communicator bias. *Communications*, *46*(2), 297–316. |
| 79 | Thompson, J. L., Kaiser, A., Sparks, E. L., Shelton, M., Brunden, E., Cherry, J. A., & Cebrian, J. (2016). Ecosystem–What? Public Understanding and Trust in conservation science and ecosystem services. *Frontiers in Communication*, *1*, 3. |
| 80 | Verma, N., Fleischmann, K. R., & Koltai, K. S. (2017). Human values and trust in scientific journals, the mainstream media and fake news. *Proceedings of the Association for Information Science and Technology*, *54*(1), 426–435. |
| 81 | von Roten, F. C. (2004). Gender differences in attitudes toward science in Switzerland. *Public Understanding of Science*, *13*(2), 191–199. |
| 82 | Wintterlin, F., Hendriks, F., Mede, N. G., Bromme, R., Metag, J., & Schäfer, M. S. (2022). Predicting public trust in science: The role of basic orientations toward science, perceived trustworthiness of scientists, and experiences with science. *Frontiers in Communication*, *6*, 822,757. |
| 83 | Jensen, J. D. (2008). Scientific uncertainty in news coverage of cancer research: Effects of hedging on scientists' and journalists' credibility. *Human communication research*, *34*(3), 347–369. |
| 84 | Nabi, R. L., Dobmeier, C. M., Robbins, C. L., Pérez Torres, D., & Walter, N. (2024). Effects of scanning health news headlines on trust in science: an emotional framing perspective. *Health Communication*, 1–13. |
| 85 | Nadelson, L., Jorcyk, C., Yang, D., Jarratt Smith, M., Matson, S., Cornell, K., & Husting, V. (2014). I just don't trust them: The development and validation of an assessment instrument to measure trust in science and scientists. *School science and mathematics*, *114*(2), 76–86. |
| 86 | Ni, H., Jordan, E., Cao, J., Kinnamon, D. D., Gottlieb, S. S., Hofmeyer, M., … & Hershberger, R. E. (2023). Knowledge of genome sequencing and trust in medical researchers among patients of different racial and ethnic groups with idiopathic dilated cardiomyopathy. *JAMA cardiology*, *8*(1), 33–42. |
| 87 | Obreja, D. M., Rughiniș, R., & Rosner, D. (2023). Examining distrust of science and scientists: A study on ideology and scientific literacy in the European Union. *Current Sociology*, 00113921231211582. |
| 88 | Piccolo, C., Pellegrini, G., Tulin, M., Szüdi, G., & Bartar, P. (2022). Experimenting with visual content: online focus group on citizens' perception and trust in science communication. *Open Research Europe*, *2*. |
| 89 | Plohl, N., & Musil, B. (2023). Assessing the incremental value of intellectual humility and cognitive reflection in predicting trust in science. *Personality and Individual Differences*, *214*, 112,340. |

**Table 1** (continued)

| No. | Reference |
|---|---|
| 90 | Post, S., & Bienzeisler, N. (2024). The Honest Broker versus the Epistocrat: Attenuating Distrust in Science by Disentangling Science from Politics. *Political Communication*, 1–23. |
| 91 | Pulle, J., Loue, S., Kiwanuka, G. N., & Francis, B. (2024). Trust in medical research: a comparative study among patients at a regional referral hospital and community members in lira District, Northern Uganda. *Journal of Empirical Research on Human Research Ethics*, *19*(1–2), 48–57. |
| 92 | Santoro, L. R., & Sydnor, E. (2024). Blind Trust, Blind Skepticism: Liberals'& Conservatives' Response to Academic Research. *American Politics Research*, *52*(1), 52–66. |
| 93 | Schrøder, T. B. (2023). Don't tell me what i don't want to hear! Politicization and ideological conflict explain why citizens have lower trust in climate scientists and economists than in other natural scientists. *Political Psychology*, *44*(5), 961–981. |
| 94 | Treise, D., Walsh-Childers, K., Weigold, M. F., & Friedman, M. (2003). Cultivating the science internet audience: Impact of brand and domain on source credibility for science information. *Science Communication*, *24*(3), 309–332. |
| 95 | Vegt, K. R., Elberse, J. E., Rutjens, B. T., Voogt, M. H., & Baâdoudi, F. (2023). Impacts of citizen science on trust between stakeholders and trust in science in a polarized context. *Journal of Environmental Policy & Planning*, *25*(6), 723–736. |
| 96 | Zhang, F. J. (2023). Political endorsement by Nature and trust in scientific expertise during COVID-19. *Nature Human Behaviour*, *7*(5), 696–706. |
| 97 | Tranter, B. (2023). Do Australians trust scientists? It depends on the 'science'. *Australian Journal of Social Issues*, *58*(4), 821–837. |
| 98 | Tranter, B., Lester, L., Foxwell-Norton, K., & Palmer, M. A. (2023). In science we trust? Public trust in Intergovernmental Panel on Climate Change projections and accepting anthropogenic climate change. *Public Understanding of Science*, *32*(6), 691–708. |
| 99 | Hatton, C. R., Barry, C. L., Levine, A. S., McGinty, E. E., & Han, H. (2022). American trust in science & institutions in the time of COVID-19. *Daedalus*, *151*(4), 83–97. |
| 100 | Hautea, S., Besley, J. C., & Choung, H. (2024). Communicating trust and trustworthiness through scientists' biographies: Benevolence beliefs. *Public Understanding of Science*, 09636625241228733. |
| 101 | Hu, W. T., Bergren, S. M., Dychtwald, D. K., Ma, Y., & Dong, X. (2023). Variations in racial and ethnic groups' trust in researchers associated with willingness to participate in research. *Humanities and Social Sciences Communications*, *10*(1), 1–10. |
| 102 | Janssen, I., & Jucks, R. (2023). The impact of communicating advocacy and scientific uncertainty on a scientist's trustworthiness. *Fachsprache-Journal of Professional and Scientific Communication*, *45*(1+2), 85–103. |
| 103 | Kim, N., Skurka, C., & Madden, S. (2024). The effects of self-disclosure and gender on a climate scientist's credibility and likability on social media. *Public Understanding of Science*, 09636625231225073. |
| 104 | Kotcher, J. E., Myers, T. A., Vraga, E. K., Stenhouse, N., & Maibach, E. W. (2017). Does engagement in advocacy hurt the credibility of scientists? Results from a randomized national survey experiment. *Environmental Communication*, *11*(3), 415–429. |
| 105 | Küçükaydın, M.A., Esen, S., & Gürbüzer, S. (2023). Did we trust in science during the COVID-19 pandemic? Modeling the relationship between trust, awareness, and conspiracy theories. *Applied Cognitive Psychology*, *37*(6), 1266–1276. |
| 106 | Larsen, M. Z., Haupt, M. R., McMann, T., Cuomo, R. E., & Mackey, T. K. (2023). The influence of news consumption habits and dispositional traits on trust in medical scientists. *International Journal of Environmental Research and Public Health*, *20*(10), 5842. |
| 107 | Michalovich, A., & Hershkovitz, A. (2020). Assessing YouTube science news' credibility: The impact of web-search on the role of video, source, and user attributes. *Public Understanding of Science*, *29*(4), 376–391. |
| 108 | Michaud, J., & Turri, J. (2018). Values and credibility in science communication. *Logos & Episteme*, *9*(2), 199–214. |

**Table 1** (continued)

| No. | Reference |
|---|---|
| 109 | Hunt, K. P., & Wald, D. M. (2020). The role of scientific source credibility and goodwill in public skepticism toward GM foods. *Environmental Communication*, *14*(7), 971–986. |
| 110 | Maggio, L. A., Krakow, M., & Moorhead, L. L. (2020). 'There were some clues': a qualitative study of heuristics used by parents of adolescents to make credibility judgements of online health news articles citing research. *BMJ open*, *10*(8), e039692. |
| 111 | Mathiesen, K. E., Barmoen, M., Bærum, K. M., & Johansson, M. (2022). Trust in researchers and researchers' statements in large carnivore conservation. *People and Nature*, *4*(1), 260–273. |
| 112 | Altenmüller, M. S., Wingen, T., & Schulte, A. (2024). Explaining polarized trust in scientists: A political stereotype-approach. *Science Communication*, *46*(1), 92–115. |
| 113 | Auchynnikava, A., & Habibov, N. (2024). Is the Effect of Educational Attainments on Trust in Scientists Underestimated?. *Science & Education*, 1–17. |
| 114 | Curnock, M. I., Nembhard, D., Smith, R., Sambrook, K., Hobman, E. V., Mankad, A., Pert, P. L., & Chamberland, E. (2024). Finding common ground: Understanding and engaging with science mistrust in the Great barrier reef region. *Plos one*, *19*(8), e0308252. |
| 115 | Friedman, R. S. (2024). Civil Disobedience by Environmental Scientists: An Experimental Study of its Influence on the Impact and Credibility of Climate Change Research. *Environmental Communication*, *18*(4), 451–464. |
| 116 | Leerink, A., Bos, M., Reijnders, D., & van Sebille, E. (2024). The (non) effect of personalization in climate texts on the credibility of climate scientists: a case study on sustainable travel. *Geoscience Communication*, *7*(3), 201–214. |
| 117 | Seyd, B., Hamm, J. A., Jennings, W., McKay, L., Valgarðsson, V., & Anness, M. (2024). 'Follow the science': Popular trust in scientific experts during the coronavirus pandemic. *Public Understanding of Science*, 09636625241253968. |
| 118 | Alper, S., Yelbuz, B. E., Akkurt, S. B., & Yilmaz, O. (2024). The positive association of education with the trust in science and scientists is weaker in highly corrupt countries. *Public Understanding of Science*, *33*(1), 2–19. |
| 119 | Angelucci, D., & Vittori, D. (2024). In science we (dis) trust: technocratic attitudes, populism, and trust in science during the COVID-19 pandemic. *European Political Science*, 1–12. |
| 120 | Burdziej, S., & Główczewski, M. (2024). Procedural fairness during university education and students' trust in science and scientists. *Studies in Higher Education*, 1–15. |
| 121 | Fuglsang, S. (2024). Is science for the rich and powerful? Investigating the relation between income and trust in science across 145 countries. *International Journal of Public Opinion Research*, *36*(1), edad045. |
| 122 | Gligorić, V., van Kleef, G. A., & Rutjens, B. T. (2024). How social evaluations shape trust in 45 types of scientists. *Plos one*, *19*(4), e0299621. |
| 123 | Jonas, M., Kerwer, M., Chasiotis, A., & Rosman, T. (2024). Indicators of trustworthiness in lay-friendly research summaries: Scientificness surpasses easiness. *Public Understanding of Science*, *33*(1), 37–57. |
| 124 | Lee, S., Taylor, M. A., Ahmed, S., & Moon, W. K. (2024). Going beyond political ideology: A computational analysis of civic trust in science. *Public Understanding of Science*, 09636625241246076. |

**Supplementary Information** The online version contains supplementary material available at https://doi.org/10.1007/s10805-026-09732-5.

**Acknowledgements** This project has received funding from the European Union, under the Horizon Europe work programme for research and innovation, in the context of the project VERITY (deVEloping scientific Research with ethIcs and inTegritY), under grant agreement No. 101058623. UK participants in Horizon Europe Project VERITY are supported by UKRI grant number 10039826 (Trilateral Research). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or UKRI. Neither the European Union nor the granting authority nor UKRI can be held responsible for them. The authors wish to express their gratitude to the VERITY consortium, particularly Agata Gurzawska, Rea Roje (TRI IE); Gabor Szüdi, Pamela Bartar (ZSI); Panagiotis Monachelis (UniWA) for their help in data screening and coding as part of the research conducted and reported in the VERITY project's deliverable D1.2 "Review Paper of Scientific Literature".

**Author Contributions** KI conceptualized the systematic review and secured funding as a member of the VERITY consortium. AA and MDV conducted database searches, and along with a team of trained coders (AG, RR, GS, PB, PM) conducted initial screening of titles and abstracts. AA and MDV performed data extraction and detailed coding, while KI independently reviewed and verified coding for a randomly selected 25% of studies. Discrepancies were resolved through consensus discussion among all authors. MDV conducted additional extended coding to capture trust operationalization, measurement approaches, and effect sizes. KI drafted the manuscript, with AA and MDV contributing to the methods and results sections. All authors reviewed and approved the final manuscript.

**Data Availability** All data supporting the conclusions of this systematic review are available within the published articles included in the review and their supplementary materials. The data codebook and extracted data are available as supplementary materials.

## Declarations

**Ethical Approval** Ethical approval was not required for this systematic review as it involved analysis of previously published data.

**Competing interests** The authors have no conflicts of interest to declare.



## References

Allum, N., Sturgis, P., Tabourazi, D., & Brunton-Smith, I. (2008). Science knowledge and attitudes across cultures: A meta-analysis. *Public Understanding of Science*, *17*(1), 35–54. https://doi.org/10.1177/0963662506070159

American Psychological Association (2025). Update on limiting access to federal databases and datasets. APA Services. https://updates.apaservices.org/update-on-limiting-access-to-federal-databases-and-datasets

Baier, A. (1986). Trust and antitrust. *Ethics*, *96*(2), 231–260. https://doi.org/10.1086/292745

Barattucci, M., Pagliaro, S., Ballone, C., Teresi, M., Consoli, C., Garofalo, A., De Giorgio, A., & Ramaci, T. (2022). Trust in science as a possible mediator between different antecedents and COVID-19 booster vaccination intention: An integration of health belief model (HBM) and theory of planned behavior (TPB). *Vaccines*, *10*(7), 1099. https://doi.org/10.3390/vaccines10071099

Behm-Bahtat, A. S., Bunt, H., Bauer, M. W., & Falade, B. (in press). Measuring trust in science through surveys: Challenges and reflections. In K. Iordanou, T. Ravn, & H. Zwart (Eds.), *Trust in science*. Springer.

Besley, J. C., & Tiffany, L. A. (2023). What are you assessing when you measure trust in scientists with a direct measure? *Public Understanding of Science*, *32*(6), 709–726. https://doi.org/10.1177/09636625231161302

Bromme, R., & Hendriks, F. (2024). Trust in science: Considering whom to trust for knowing what is true. In R. C. Mayer & B. M. Mayer (Eds.), *A research agenda for trust* (pp. 37–49). Edward Elgar Publishing. https://doi.org/10.4337/9781802200942.00011

Centola, D., Becker, J., Brackbill, D., & Baronchelli, A. (2018). Experimental evidence for tipping points in social convention. *Science*, *360*(6393), 1116–1119. https://doi.org/10.1126/science.aas8827

Cologna, V., & Siegrist, M. (2020). The role of trust for climate change mitigation and adaptation behaviour: A meta-analysis. *Journal of Environmental Psychology*, *69*. https://doi.org/10.1016/j.jenvp.2020.101428. Article 101428.

Cologna, V., Mede, N. G., Berger, S., Besley, J., Brick, C., Joubert, M., Maibach, E. W., Mihelj, S., Oreskes, N., Schäfer, M. S., van der Linden, S., Aziz, A., Abdulsalam, N. I., Abu Shamsi, S., Aczel, N., Adinugroho, B., Alabrese, I., Aldoh, E., Alfano, A., & Zwaan, M., R. A (2025). Trust in scientists and their role in society across 68 countries. *Nature Human Behaviour*, *9*(4), 713–730. https://doi.org/10.1038/s41562-024-02090-5

Fage-Butler, A., Ledderer, L., & Nielsen, K. H. (2022). Public trust and mistrust of climate science: A meta-narrative review. *Public Understanding of Science*, *31*(7), 832–846. https://doi.org/10.1177/09636625221110028

Goldenberg, M. J. (2023). Public trust in science. *Interdisciplinary Science Reviews*, *48*(2), 366–378. https://doi.org/10.1080/03080188.2022.2152243

Grant, W. J. (2023). The knowledge deficit model and science communication. In Oxford Research Encyclopedia of Communication. https://doi.org/10.1093/acrefore/9780190228613.013.1396

Gundersen, T., & Holst, C. (2022). Science advice in an environment of trust: Trusted, but not trustworthy? *Social Epistemology*, *36*(5), 629–640. https://doi.org/10.1080/02691728.2022.2101564

Gurzawska, A., Yalaz, E., & Zamorano Barrios, M. M. (in press). Ecosystem of trust: A systems approach to trust in science. In K. Iordanou, T. Ravn, & H. Zwart (Eds.), *Trust in science*. Springer.

Hardin, R. (2002). *Trust and trustworthiness*. Russell Sage Foundation.

Harvey, K., & Laurie, G. (2024). Proxies of trustworthiness: A novel framework to support the performance of trust in human health research. *Journal of Bioethical Inquiry*, *21*(4), 625–645. https://doi.org/10.1007/s11673-024-10335-1

Hautea, S., Besley, J. C., & Choung, H. (2024). Communicating trust and trustworthiness through scientists' biographies: Benevolence beliefs. *Public Understanding of Science*, *33*(7), 872–883. https://doi.org/10.1177/09636625241228733

Hendriks, F., Kienhues, D., & Bromme, R. (2015). Measuring laypeople's trust in experts in a digital age: The Muenster Epistemic Trustworthiness Inventory (METI). *Plos One*, *10*(10). https://doi.org/10.1371/journal.pone.0139309. Article e0139309.

Hendriks, F., Kienhues, D., & Bromme, R. (2016). Trust in science and the science of trust. In B. Blöbaum (Ed.), *Trust and communication in a digitized world: Models and concepts of trust research* (pp. 143–159). Springer. https://doi.org/10.1007/978-3-319-28059-2_8

Hendriks, F., Mayweg-Paus, E., Felton, M., Iordanou, K., Jucks, R., & Zimmermann, M. (2020a). Constraints and affordances of online engagement with scientific information: A literature review. *Frontiers in Psychology*, *11*, 572744. https://doi.org/10.3389/fpsyg.2020.572744

Hendriks, F., Kienhues, D., & Bromme, R. (2020b). Replication crisis = trust crisis? The effect of successful vs failed replications on laypeople's trust in researchers and research. *Public Understanding of Science*, *29*(3), 270–288. https://doi.org/10.1177/0963662520902383

Iordanou, K. (2016). From theory of mind to epistemic cognition: A lifespan perspective. *Frontline Learning Research*, *4*(5), 106–119. https://doi.org/10.14786/flr.v4i5.252

Iordanou, K. (2022). Supporting strategic and meta-strategic development of argument skill: the role of reflection. *Metacognition and Learning*, *17*(2), 399–425. https://doi.org/10.1007/s11409-021-09289-1

Iordanou, K., Ravn, T., & Zwart, H. (Eds.). (in press). *Trust in science*. Springer.

Iordanou, K., & Kuhn, D. (2025). Investigating climate change through argumentation: Purposeful questioning supports argumentation and knowledge acquisition. *Journal of Experimental Psychology: Applied*, *31*(4), 276–285. https://doi.org/10.1037/xap0000534

Kienhues, D., Jucks, R., & Bromme, R. (2020). Sealing the gateways for post-truthism: Reestablishing the epistemic authority of science. *Educational Psychologist*, *55*(3), 144–154. https://doi.org/10.1080/00461520.2020.1784012

Koch, S. (2020). Responsible research, inequality in science and epistemic injustice: an attempt to open up thinking about inclusiveness in the context of RI/RRI. *Journal of Responsible Innovation*, *7*(3), 672–679. https://doi.org/10.1080/23299460.2020.1780094

König, L., & Jucks, R. (2019). Hot topics in science communication: Aggressive language decreases trustworthiness and credibility in scientific debates. *Public Understanding of Science*, *28*(4), 401–416. https://doi.org/10.1177/0963662519833903

Korte, A. (2025). *AAAS leaders: We must stay focused amid turmoil*. American Association for the Advancement of Science. https://www.aaas.org/news/aaas-leaders-we-must-stay-focused-amid-turmoil

Kuhn, D., & Iordanou, K. (2022). Why do people argue past one another rather than with one another? In N. Ballantyne, & D. Dunning (Eds.), *Reason, Bias, and Inquiry: The Crossroads of Epistemology and Psychology* (pp. 324–338). Oxford University Press. https://doi.org/10.1093/oso/9780197636916.003.0015

Kuhn, D., Iordanou, K., Pease, M., & Wirkala, C. (2008). Beyond control of variables: What needs to develop to achieve skilled scientific thinking? *Cognitive Development*, *23*(4), 435–451. https://doi.org/10.1016/j.cogdev.2008.09.006

Landrum, A. R., Eaves Jr, B. S., & Shafto, P. (2015). Learning to trust and trusting to learn: A theoretical framework. *Trends in Cognitive Sciences*, *19*(3), 109–111. https://doi.org/10.1016/j.tics.2014.12.007

Lasswell, H. D. (1948). The structure and function of communication in society. In L. Bryson (Ed.), *The communication of ideas: A series of addresses* (pp. 37–51). Institute for Religious and Social Studies. (distributed by Harper).

Lazić, A., & Žeželj, I. (2021). A systematic review of narrative interventions: Lessons for countering anti-vaccination conspiracy theories and misinformation. *Public Understanding of Science*, *30*(6), 644–670. https://doi.org/10.1177/09636625211011881

Lewandowsky, S., Pilditch, T. D., Madsen, J. K., Oreskes, N., & Risbey, J. S. (2019). Influence and seepage: An evidence-resistant minority can affect public opinion and scientific belief formation. *Cognition*, *188*, 124–139. https://doi.org/10.1016/j.cognition.2019.01.011

Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review*, *20*(3), 709–734. https://doi.org/10.5465/amr.1995.9508080335

Mede, N. G., & Schäfer, M. S. (2020). Science-related populism: Conceptualizing populist demands toward science. *Public Understanding of Science*, *29*(5), 473–491. https://doi.org/10.1177/0963662520924259

Ohanian, R. (1990). Construction and validation of a scale to measure celebrity endorsers' perceived expertise, trustworthiness, and attractiveness. *Journal of Advertising*, *19*(3), 39–52. https://doi.org/10.1080/00913367.1990.10673191

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., & Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *Journal of Clinical Epidemiology*, *134*, 178–189. https://doi.org/10.1016/j.jclinepi.2021.03.001

Peters, G. J., & Crutzen, R. (2024). Knowing what we're talking about: Facilitating decentralized, unequivocal publication of and reference to psychological construct definitions and instructions. *Meta-Psychology*, *8*. https://doi.org/10.15626/MP.2022.3638

Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., Britten, N., Roen, K., & Duffy, S. (2006). Guidance on the conduct of narrative synthesis in systematic reviews: A product from the ESRC Methods Programme. *Lancaster University*. https://doi.org/10.13140/2.1.1018.4643

Roberts, M. R., Reid, G., Schroeder, M., & Norris, S. P. (2011). Causal or spurious? The relationship of knowledge and attitudes to trust in science and technology. *Public Understanding of Science*, *22*(5), 624–641. https://doi.org/10.1177/0963662511420511

Scharff, D. P., Mathews, K. J., Jackson, P., Hoffsuemmer, J., Martin, E., & Edwards, D. (2010). More than Tuskegee: Understanding mistrust about research participation. *Journal of Health Care for the Poor and Underserved*, *21*(3), 879–897. https://doi.org/10.1353/hpu.0.0323

Scheufele, D. A. (2022). Thirty years of science–society interfaces: What's next? *Public Understanding of Science*, *31*(3), 297–304. https://doi.org/10.1177/096366252210759

Varda, C., Iordanou, K., Antoniou, J., Zamorano Barrios, M. M., Yalaz, E., Gurzawska, A., Szüdi, G., Bartar, P., & Häberlein, L. (2025). The role of stewards of trust in facilitating trust in science: A multistakeholder view. *Journal of Academic Ethics*, *23*(3), 463–483. https://doi.org/10.1007/s10805-024-09583-y

Younger-Khan, S., Weidmann, N. B., & Oswald, L. (2024). Consistent effects of science and scientist characteristics on public trust across political regimes. *Humanities and Social Sciences Communications*, *11*, 1379. https://doi.org/10.1057/s41599-024-03909-2

Zarzeczna, N., Hanel, P. H. P., Rutjens, B. T., Bono, S. A., Chen, Y. H., & Haddock, G. (2024). Scientists, speak up! Source impacts trust in health advice across five countries. *Journal of Experimental Psychology: Applied*, *30*(3), 430–441. https://doi.org/10.1037/xap0000500

Zeybek Kabakci, G., Kara, U. Y., Baydar Çavdar, G., & Toros, E. (2025). Bridging the divide: An interdisciplinary analysis of trust in science. *SAGE Open*, *15*(3). https://doi.org/10.1177/21582440251352376

Zwart, H., Mendes, B., A., & Blok, V. (2024). Epistemic inclusion: A key challenge for global RRI. *Journal of Responsible Innovation*, *11*(1). https://doi.org/10.1080/23299460.2024.2326721